## **CLAIMS**

What is claimed is:

- 1. A method for quantification of strain imaging comprising the steps of:
- (a) performing a motion analysis on at least two selected regions of interest (ROI) before and after tissue compression;
  - (b) providing a strain estimate for each of the at least two ROIs; and
- (c) comparing the strain estimates of each of the at least two ROIs to quantify the strain for the at least two ROIs.
  - 2. The method of claim 1 wherein the performing step (a) comprises the steps of:
  - (a1) generating a plurality of blocks for each of the at least two ROIs; and
- (a2) utilizing a block matching technique to perform a motion analysis on each of the at least two ROIs.
- 3. The method of claim 2 wherein each of the plurality of blocks touch a boundary of the at least two ROIs.
- 4. The method of claim 1 wherein the providing step (206) (b) is performed in accordance with the equation:

$$ST = \left\| \sum_{i=i_1}^{i_2} \frac{(a_i - b_i)}{d_i} \right\| x 100\%$$

where ST is the strain estimate; and where  $a_i$  and  $b_i$  are the displacement components for two blocks, which cross over the boundary of a specific ROI, in the direction of i-th A-line,  $d_i$  is a

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distance between the two blocks, and i<sub>1</sub> and i<sub>2</sub> are indices along an A-line on a B-mode image covering the ROI.

- 5. A method for quantification of strain imaging comprising the steps of:
- (a) performing (206) a motion analysis on a plurality of selected regions of interest (ROIs) (302 and 304; the performing step (a) further comprises the steps of: (a1) generating a plurality of blocks (150) for each of the at least two ROIs (302 and 304); and (a2) utilizing a block matching technique to perform a motion analysis on each of the plurality of ROIs (302 and 304), wherein each of the plurality of blocks (150) touch a boundary of the at least two ROIs (302 and 304);
  - (b) providing a strain estimate for each of the plurality of ROIs (302 and 304; and
- (c) comparing (208) the strain estimates of each of the plurality of ROIs to quantify the strain for the at least two ROIs (302 and 304).
- 6. The method of claim 5 where the strain estimate is performed in accordance with the equation:

$$ST = \left\| \sum_{i=i_1}^{i_2} \frac{(a_i - b_i)}{d_i} \right\| x 100\%$$

where ST is the strain estimate; and where  $a_i$  and  $b_i$  are the displacement components for two blocks, which cross over the boundary of a specific ROI, in the direction of i-th A-line.  $d_i$  is a distance between the two blocks, and  $i_1$  and  $i_2$  are indices along an A-line on a B-mode image covering that specific ROI.

- 7. A computer readable medium for quantification of strain imaging including program instructions for:
- (a) performing (204) a motion analysis on at least two selected regions of interest (ROI) before and after tissue compression;
  - (b) providing (206) a strain estimate for each of the at least two ROIs; and

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- (c) comparing (208) the strain estimates of each of the at least two ROIs to quantify the strain for the at least two ROIs.
- 8. The computer readable medium of claim 7 wherein the performing (206) step (a) comprises the steps of:
- (a1) generating a plurality of blocks (150) for each of the at least two ROIs (302 and 304); and
- (a2) utilizing a block matching technique to perform a motion analysis on each of the at least two ROIs (302 and 304).
- 9. The computer readable medium of claim 7 wherein each of the plurality of blocks touch a boundary of the at least two ROIs (302 and 304).
- 10. The computer readable medium of claim 7 wherein the providing step (206) (b) is performed in accordance with the equation:

$$ST = \left\| \sum_{i=i_1}^{i_2} \frac{(a_i - b_i)}{d_i} \right\| x 100\%$$

where ST is the strain estimate; and where  $a_i$  and  $b_i$  are the displacement components for two blocks, which cross over the boundary of a specific ROI, in the direction of i-th A-line,  $d_i$  is a distance between the two blocks, and  $i_1$  and  $i_2$  are indices along an A-line on a B-mode image covering that specific ROI.

- 11. A computer readable medium for quantification of strain imaging having program instructions for:
- (a) performing (206) a motion analysis on a plurality of selected regions of interest (ROIs) (302 and 304); the performing step (a) further comprises the steps of: (a1) generating a plurality of blocks (150) for each of the plurality of ROI s(302 and 304);
- (a2) utilizing a block matching technique to perform a motion analysis on each of the plurality of ROIs (302 and 304), wherein each of the plurality of blocks touch a boundary of the

plurality of ROIs (302 and 304);

- (b) providing (206) a strain estimate for each of the plurality of ROIs; and comparing (208) the strain estimates of each of the plurality of ROIs to quantify the strain for the at least two ROIs (302 and 304).
- 12. The computer readable medium of claim 11 where the strain estimate is performed in accordance with the equation:

$$ST = \left\| \sum_{i=l_1}^{l_2} \frac{(a_i - b_i)}{d_i} \right\| x 100\%$$

where ST is the strain estimate; and where  $a_i$  and  $b_i$  are the displacement components for two blocks, which cross over the boundary of a specific ROI, in the direction of i-th A-line.  $d_i$  is a distance between the two blocks, and  $i_1$  and  $i_2$  are indices along an A-line on a B-mode image covering that specific ROI.